WELCOMING REMARKS

Honorable Daniel K. Akaka, United States Sentor, Hawai'i (via video)

Aloha kakou! Welcome to Hawai'i! I am pleased to greet you and wish you well as you discuss marine debris, a very important topic for the future of ocean life. I would like to recognize Allen Tom, manager of the Hawaiian Islands Humpback Whale National Marine Sanctuary, for his hard work and dedication in putting this international conference together. And I would like to thank Dr. D. James Baker, the Administrator of NOAA, for his continued support of efforts such as this to address marine debris.

My hope is that as you meet in our beautiful islands, your efforts will help international, federal, state, and local agencies and the public at large to serve as good stewards of our valuable ocean resources. I hope you will have an opportunity to understand and experience firsthand how important the sea is to Hawaiians and the native Hawaiian culture, and come to see how we practice malama kai—the care of the sea.

There will be other distinguished speakers talking about legal frameworks, biological and ecological impacts of marine debris, economic costs, and current efforts to remove debris from the ocean. These are all important topics for the conference, and I look forward to the results of the working groups and their advice about what we can do about marine debris.

I want to talk about marine debris from a different perspective. I want to talk about what it means to me as a native Hawaiian. The essence of Hawai'i is captured not by the physical beauty of its islands, but by the beauty of its people and their willingness to welcome others into their society in order to share their culture, environment, and lives. This attitude, often referred to as the "Aloha spirit," originates from the culture and traditions of Hawai'i. It is one of the many attributes that contribute to the uniqueness of the state of Hawai'i.

The motto on Hawai'i's great seal reads, Ua mau kae 'ea 'o ka 'aina 'i ka pono, "the life of the land is perpetuated in righteousness." This statement captures the culture of native Hawaiians. Prior to Western contact, the native Hawaiians lived in an advanced society that was steeped in science. The native Hawaiians honored their 'aina (land), kai (sea), and environment. They developed methods of irrigation, agriculture, aquaculture, navigation, medicine, and fishing where the land and sea were efficiently used without waste or damage. Respect for the environment and for others formed the basis for our culture and tradition.

We can learn a valuable lesson from these traditional practices and values as we work to conserve and protect our precious natural resources for future generations.

My own love for the ocean comes from a lifetime of living in Hawai'i. I learned much from my parents, our large Akaka ohana (family), and kapuna (respected elders) about malama kai. I have sailed to other islands using celestial navigation just as Polynesian explorers did to reach these islands and journey throughout the Pacific.

I enjoy fishing as did my father and family before me. I fished for both reef fish as well as bottom fish, including Ahi and Mahimahi, kumu (my favorite), Weke, 'Ama'ama, 'Aweoweo, Opakapaka, Papio and Ulua. I helped my grandmother gather opihi, shellfish, and the seaweed limu for special meals. My great-grandparents depended on the ocean for life. Like most Hawaiian families, most of our family's nutritional needs were met by the sea.

We were taught not to waste ocean life or take more than we could use. It was not pono (not proper) to catch more fish than you could consume. If we caught more than we needed, we dried, smoked, and shared with others. We did not sell fish to others. A healthy reef system was critical for abundant fish.

In many ways, Native Hawaiians and Polynesians practiced what is now called sustainable fishing and "limited access." In traditional Polynesian systems, access to reef areas and fishing grounds was granted by the ranking chief. The fishing grounds were not open to everyone. A poacher's entire village was held financially responsible for any infraction.

Today fishery management has come full circle back to the old ways. Commercial fishing is moving rapidly to various forms of limited access. I hear that lobstermen in Maine are using their long traditions in each cove to design localized fishing areas that they manage with the state.

Native Hawaiians also had effective and resourceful fisheries, long before Western contact. One difference was that the gear was made of natural substances and was degradable by biology and wave action. Hawaiians utilized leaf sweeps made of coconut leaf fronds woven with leafy vines. We did leaf sweeps in the lagoons for hukilau feasts and celebrations. Any lost gear did not kill seals, turtles or birds. It was only with the advent of monofilament line and nets that fishing gear became more deadly in the long run.

Clearly, today's marine debris is not a part of the natural order of the ocean, lagoons, and reefs of our islands. I am talking specifically about the nondegradable, petroleum-based plastics and toxins that we find even 200 miles from shore—beyond the U.S. Exclusive Economic Zone. Abandoned or lost fishing nets and lines foul the reefs and entangle seals, turtles, and birds.

This is of critical importance to Hawai'i—the only state in the Union that is completely surrounded by ocean. We are the most ocean-dependent state in the United States; our economic well-being and security depend upon the sea. In 1999, Hawai'i generated $14 billion from travel and tourism because of the ocean, our coral reefs and beaches, and our renowned Aloha spirit. This figure is forecast to grow to $28.7 billion in just ten years. So issues discussed and solutions proposed at this conference are of great economic importance to our islands.

I am very encouraged by efforts to clean up debris in the Northwestern Hawaiian Islands, and I applaud the hard work of the National Marine Fisheries Service, the U.S. Navy, and the U.S. Coast Guard for their reef cleanup effort. I understand that several tons of gear still remain in the Northwestern Hawaiian Islands! The care and stewardship of the Northwestern Hawaiian Islands is extremely important as we embark on the series of conferences organized under President Clinton's directive to protect the islands.

I know that many of you are returning from the U.S. Coral Reef Task Force in American Samoa. I am sure that you have seen many of the same ocean issues that we face in Hawai'i. I am pleased to tell you that the Conservation and Reinvestment (CARA) legislation that I'm working on in the Senate Energy Committee will bring much needed funds to coral reefs. It will bring funds to coastal management and to marine sanctuaries, and to fisheries research and enforcement. I am gratified that our efforts have resulted in a strong coastal conservation component in this groundbreaking conservation legislation.

In the three decades since the founding of NOAA and enactment of the Coastal Zone Management Act and the International Decade of Ocean Exploration, we have made good progress towards conserving ocean resources. Most coastal states have extended their jurisdictions to 200 miles offshore to manage resources better. We now know the intimate relationship between the ocean and the atmosphere. We acknowledge the importance of nearshore and coastal areas to the health of the oceans. And we have extended our abilities to monitor and explore nearshore deepwater ocean environments with technologies that did not exist twenty years ago!

As an advocate for the oceans, I support marine technology and exploration. In many ways, the sea, in all its mystery and power, remains the last frontier. Settlers tamed the American West and adventurers have conquered Mt. Everest and the poles of the earth. Man has walked on the moon and is gearing up to live in space. Yet we have so much more to learn about the sea. Our hope and our task is to ensure that our precious ocean resources continue to enrich, sustain, and nurture our lives and the lives of our children and grandchildren in the new century.

Thank you.

"PILIKIA"

Dayton "Lee" Alverson, Chairman of the Board,
Natural Resources Consultants, Washington

INTRODUCTION

Well, the title of my section actually implies that I'm going to talk about derelict gear and fishermen. I'm going to talk a little bit about fishermen, but we have a section tomorrow dealing with the issue and I really don't want to preempt or pull key issues out of that section. So I'm going to cast a lot of my talk in reflections.

HISTORY OF MARINE DEBRIS CONFERENCES

This was done somewhat yesterday and I think it's important to realize some of the history of this process. As it was mentioned, we gathered here in 1984 for the first major marine debris conference that was held on a global scale. Another smaller group gathered in Kona in 1987, which was organized by the fishing industries of the North Pacific and dealt with the same issue. As I remember, we were in Honolulu back in 1989. Then there was a session in the '90s in Miami, and now we're back in Honolulu for the beginning of this century.

In addition to those meetings, there was an international task force on persistent marine debris. Each of these conferences had an output of technical papers building a sort of library of information related to marine debris. It's rather interesting when I go back to the rosters to see who was in attendance; I notice Kitty Simonds, Jim Coe, Richard Shimura, Chuck Fowler, and yours truly were there a lot of the times. There is something rather attractive or compelling about the marine debris conference in Hawai'i. Marine debris drifts down from the North Pacific and, as I understand, from the Northwest Pacific and about every 2.3 years it gets across the ocean. The way I figured, about every 4.2 years, we gather up enough energy to have another marine debris conference and attract a lot of people.

Now there's one thing I was very pleased with yesterday, but I'll start off with a few problem areas. I saw an awful lot of repetition in terms of figures, comments, and recommendations that were embodied in an earlier meeting in 1984. In fact, there's one picture, if you remember, that has some kind of six-pack disc with a fish through it. I don't know who has the rights to that picture, but I've seen it so many times, he or she must be getting rich on royalties. I think we need a new picture of a fish caught in some different way; we need something new.

But there was a new element yesterday and that was the gathering of students. I think this is very important if the process is to go forward. We need to bring the younger people in to be a part of this process, they can commit their fresh minds and new ideas to an issue that a number of us have been working on for the better part of two decades. In fact, I'm convinced that if there's a good student at the University of Hawai'i or maybe up at the

University of Alaska, Oregon State, or University of Washington, a good master's thesis can be made from this material; it could be put together in a book. If you look at the history, we're talking about some 4,000 pages of documented reports, technical reports, and descriptions of marine debris problems. The history of these sessions include: (a) sources of marine debris; (b) types of marine debris; (c) composition of marine debris; (d) quantities of debris; (e) fate of marine debris in space; (f) fate of the various plastic materials in time and in relation to environmental factors; (g) enforcement; and (h) the legal history of marine debris. Put it together and it would be a very convincing story.

Somehow we haven't gotten the message out as well as we should, nor have we elevated it to a level of national concern. I picked up a new book that came out, and as matter fact, it was on my desk the day before I came to the conference; it's called Fishing Grounds. It's a story of the North Pacific and the concerns of probably 100 different scientists of what we need to do and what is the nature of the problems. I don't see a single mention of the word marine debris in the book. And when I look through a number of documents that dealt basically with ocean problems, I find we're pretty far down on the pecking order. Again, I don't know why, because if it is really as bad as we perceive in terms of impacts, and I stress impacts, on marine organisms, and the environment; something needs to be done. Perhaps we need to more carefully focus our questions on problem areas. I came to a marine debris conference, I'd say seventeen years ago, when Kitty was involved with this first conference and she was telling me we've got a problem with your damn North Pacific trawl gear nets ending up here and dropping on our coral, it's causing a lot of problems. Well, we have seventeen years under our belts, and I thought to myself, the problem is probably gone, but alas I get on the telephone to Kitty and she says we've got "pilikia"—a big problem. And it remains. The question is, why are we continuing to look at it? I suppose we shouldn't really be surprised. Think about it; to define a problem is frequently easier than implementing a solution. Additionally, we don't pay them a great deal for writing prescriptions, but the cost of good medicine is fairly high.

In the standing, from documents of the various conferences on marine debris that have preceded this meeting, including the meeting of the task force, I come up with twenty-six recommendations that relate to the needs of research and actions. I sift them down and ask, are they really different? A number are really just repeats of the earlier conference, phrased in somewhat different ways, and I come up with ten fundamental recommendations that tell us what to do. I still think they're pretty good. Some of the more important include:

Education
The education of the public; education of our children; education of those who go to sea and are users; education of those who research the issue and education of those who are harvesters in the sea; this has to be continued. In the sense of stewardship, those who are using the nets and the webbing and the plastics must recognize that these items are finding a way into the world's oceans and are generating a problem. I put that high on my continued list of needed actions.

Identify Loss of Commercial Fishing Gear
The developable means of implementing a process of identifying lost commercial fishing gear. We appear to be making progress on that line. There have been a number of ways people have begun to mark gear, set gear, and take care of the way they handle the gear that has led to improvement.

Recovery of Lost Commercial Fishing Gear
Examine means to reduce the losses of fishing gear, including recovery of lost gear. Obviously, that must be one of the conclusions of this meeting.

Recycle Used and Lost Fishing Gear
Investigate, promote, and enhance activities relating to recycling of used and lost fishing gear. We're going to hear more about this matter. The process has started in several areas and some people are doing this.

Report Economic Losses
Study and report on economic losses to users of ocean space resulting from marine debris. We heard something about that yesterday. We still don't have any great quantification of that in terms of loss. I think there's enough evidence that there is a big problem and I'm not concerned about any detailed quantitative assessment of what the losses are. One thing I am concerned about is the many recommendations I see that deal with understanding the economic consequences to ships, safety at sea, the environment, etc. But I've never seen a recommendation that says, should we quantify the economic impact? Chuck Fowler has done some work on this in terms of the community of animals that are impacted by marine debris. We only have a fragment of an idea of what's going on in this particular area.

Develop a Safe Process for Onboard Disposal of Marine Debris
This is not an easy job as we heard the other day. We need to give this issue careful attention and develop a standard definition for biodegradable. These are fundamental issues that came up, other than specific research processes. The question is, where are we going from here?

Encourage Related Industry to Become Involved
Because of the global characteristics of marine debris and the magnitude of user groups that contribute to the problem, the fishing groups participating in this conference should focus their efforts to encourage other industry contributors to work towards solving the marine debris problem and become involved in seeking solutions.

Encourage Local Programs
The fishing industry should encourage local programs to further the education of fishermen, port authorities, resource managers, other seafarers, and the general public regarding the scope, magnitude, and consequences of growing debris problems.

Encourage Posting of Notices
Fishing vessels/operators in the North Pacific should be encouraged to post, in plain view, notices to officers and crew that the discharge of plastics in the ocean is contrary to the international laws that were expected to come into force in December 1998.

Establish an Effective Shoreside Refuse Disposal System
Participants in this congress should encourage their organizations to cooperate with dock authorities and other government agencies to establish an effective shoreside refuse disposal system.

I don't know how many of these recommendations have been implemented. Although some have been partly implemented, I don't know how well the industry has met its pledge. I'm going to repeat the industry's pledge because this, incidentally, came out of the 1987 group and it shows a rather broad understanding of the nature of the problems faced by the fishing industry. It was called "Principles and Resolutions" and it says:

> Representatives of the fishing industry from Canada, the Republic of China, Japan, the Republic of Korea, and the United States represented at the North Pacific Rim Conference recognize that synthetic marine debris of various origins, including lost and discarded fishing gear, constitute a growing threat to marine life as well as safety at sea, realizing that the maintenance, preservation, and productivity of the ocean environment is in the interest of the world fishing industry and the society as a whole. They further recognize that the fishing industry should make every effort to prevent the deterioration of the ocean's environment by promoting education programs and initiating procedures which will lead to a reduction of marine debris; in particular, plastic materials that are being discarded in the world's oceans. Further realizing the reduction of such

> debris will benefit fishermen throughout the world as well as other users of the ocean environment and noting that the programs on marine debris are distinct and separate from those associated with the direct catch made during fishing trips. The fishing industry should commit to the realization as follows:
>
> Every effort should be made to insure that plastic debris is not discarded at sea and loss of fishing gear should be avoided where feasible or possible. The goal should be to achieve, by incineration of non-toxic combustible materials when feasible, retention of synthetic materials for short site recycling or disposable and disposal of development onboard procedures for the handling of persistent plastic. (Almost all these we heard talked about yesterday.)
>
> Maximum efforts should be made to reduce the quality of synthetics onboard by minimum use of plastic packing material, the use of washing of dishware, and other eatable utensils.

Remember the Admiral yesterday, "Special attention should be given to promote the development of affordable technology and operating procedures, which will lead to the reduction in the loss of fishing gear and which will enhance the recovery of fishing gear."

The questions that will confront this August group are, is there anything new to say that will send a message at the end of this conference? Is it perhaps time to clearly identify the source of debris generating negative impacts on the ocean environment and find legal or other means to resolve the problems?

In this respect, I hope you will take careful time to articulate your concerns, write them in detail, and narrow the scope of our recommendations. We can solve a number of significant problems if we identify them and focus on solutions. We can't take a shotgun approach and say we're going to do everything. But we can say there's a problem in Hawai'i and this is what the character of the problem is, state the scope of impacts and what we intend to do to solve them. We must identify from where the material comes and how we intend to initiate national or international activity that minimizes current problems.

I'm just about finished here and I wanted to talk a little bit about how you take care of the details because it reminds me of a story about two Hawaiians, a kane and wahine. They were out on a fishing boat and they were pretty far south of here, down towards Tahiti somewhere when they got caught in a big storm. They were married and they got lost at sea. This is not a Gilligan's Island story. They ended up on this small island that had plenty of coconuts, taro, breadfruit, and some pig; they could survive. But of course their goal

was to get off the island. Day after day they kept looking and searching for ships on the horizon that never showed up. Thirty years later, they're both sixty, and they're still on the island. The wahine is walking on the beach and finds a bottle, she stoops down, picks it up, and cleans it off; it's a beautiful vase. She notices it has a screw top lid. She screws it off and out comes this gigantic genie. The genie looks down at them and says, "I've been in this vase for 10,000 years and I'm going to honor you each with one wish. But be careful that you articulate your wish properly." The genie turned to the young lady and says, "What's your wish?" She says, "I want two first class tickets to Hawai'i, and I want an airport to be on this little island, and a 747 sitting over there to pick me up and I want a reservation for three full weeks at the Halekulani." Suddenly, there was an airport with a 747 waiting, she and her husband were ready to go to Hawai'i. Then the genie looked at her husband and said, "Well, what's your wish?" He got a big smile, thinking I am going back to Hawai'i and will have a second honeymoon with my wife, he said, "I'd like my wife to be thirty years younger than me." In a second he was 90 years old. So be careful about how you make your recommendations.

It may be difficult to relate my attempted humor at this conference to the mandate, but it is my hope that any new recommendations will address the problem of resolution. In this regard, we're not going to return the world's ocean to a pristine state. On the other hand, it would seem that there are some specific marine debris problems, in specific regions, that are subject to resolution and mitigation. I hope that we spend some effort trying to sort these out and give them priority.

CONCLUSION

In conclusion, through all of these conferences, I've never seen marine debris brought into the equation of mortality. I talked a little bit about it, but at the present time, the ICES scientists are attempting to expand the overall fishing mortality. This is a complicated equation that includes all of the different things that are affecting the fate of animals in the ocean.

It starts with the overall fishing mortality as a: (a) function of what the commercial fisherman catches and lands; (b) function of whatever fishermen catch during recreational activities; and (c) function of what subsistence fisheries take out of the oceans. It also looks at the function of incidental catch, discarding, the effect of the fishing gear on the habitat, and the effects of ghost fishing. Three of these basic items, adding up to the summation of instantaneous fishing mortality, are concerned with marine debris.

We generally discuss marine debris in a very qualitative sense. There's lots of this, there's lots of that, and we know it moves from here to here. But there's not very much in the way of attempts to sit down and ask, what are the populations impacted by marine debris and can we differentiate them from the other factors that impact the equation? I leave you with that to think about.

I only have one comment, Kitty, and I know you listened to the Admiral yesterday. I thought the Admiral gave a very, very nice talk. He brought to our attention a lot of interesting things. But I also know the Admiral wasn't in the same war I was in, because we were not "throwing around environmentally friendly stuff" in WWII.

- Transcribed from a speech given on August 8, 2000.

CURRENT EDUCATION AND PUBLIC OUTREACH EFFORTS TO ADDRESS DERELICT FISHING GEAR

Seba B. Sheavly, Director, Marine Debris Prevention Campaign,
Center for Marine Conservation, Virginia

INTRODUCTION

Good morning. I've been asked to talk to you today about current education and public outreach efforts related to derelict gear and marine debris. We can summarize this very easily—existing efforts are inadequate and in many areas they are now non-existent. Shifting and dwindling appropriations, inadequate monitoring, and ineffective enforcement activities have created an unsteady foundation for establishing long-term mechanisms to reduce the presence and impacts of derelict gear. Based on what other speakers have told us during this conference so far, I think we can say that derelict gear still poses a problem. Well, if derelict gear is still a problem, what do we need to do to handle this issue related to education and public outreach efforts?

MARINE DEBRIS EDUCATION PROGRAMS

First of all, we know that lost and discarded gear in the form of traps or pots, monofilament line, rope, gill nets, longlines, dredges, and trawls are the result of illegal dumping, accidental loss, or system failure. Derelict gear has been documented since the 1930s to impact marine wildlife through entanglement and ingestion, wasting valuable fishery resources. It can destroy fragile coral reef systems and other aquatic habitats. It poses a threat to human health and safety through vessel disablement and diver interactions. With this background information, the question arises—if we are not currently conducting campaigns related to marine debris and derelict gear, were we ever doing programs and campaigns? The answer is yes. From the mid-'80s until the mid-'90s many programs were in place, the effort had momentum. But starting in the mid-'90s the momentum began to decrease due to changes in funding and programming. Now in the new millennium, we are almost at a standstill in dealing with this issue. If we are to revive efforts to handle this problem, we should first study what we have done in the past. From this information we can capitalize on our past successes and hopefully not reinvent the wheels we have already made.

History

Traditional educational and outreach programs have been designed to inform people about the effects of debris and encourage better disposal practices. Other approaches have included modification in the manufacture of gear so that fewer plastic components are used. Alternative port disposal facilities and practices have been developed to handle garbage and damaged gear. Beach cleanup programs have been conducted to promote public awareness and collect data on the types and amounts of debris. Scientific monitoring programs have been conducted to assess the types and sources of marine debris found along beaches.

Finally, in some regions, a "Code of Conduct" has been developed for fisheries activities related to acceptable practices for solid waste disposal and gear retrieval.

If we want to conduct effective programs, what should they look like? What should we be doing? Well, that's a good question. First of all, you have to know who your audiences are. The audience associated with the derelict gear issue is varied and diverse.

Involving the Right People

There are several audiences related to commercial fishing and derelict gear issues. The core of this group consists of fishers ranging from single, subsistence individuals who may or may not own their own boats to crews on large trawlers. Business and industry associated with equipment and boat manufacturing and marketing are also part of this audience as they are responsible for the production and sale of the materials used by fishers. Individuals who are part of the fish processing industry, including marketing, are also part of this group. And last but not least, we also have to work with the government, regulatory agencies, and resource managers—they are all part of this picture. If you have that vision in your mind, then you know who our audience is and why our work has to be so comprehensive.

Types of Activities—Public Education and Outreach

Well, what types of activities should we be doing? Over the past sixteen plus years we have learned that we need to conduct targeted educational programs and campaigns. In combination with legislative and enforcement strategies related to MARPOL compliance and national fisheries management approaches, a variety of supportive methodologies are needed to change behaviors of fishers and how they manage the handling and disposal of fishing gear and other wastes. Well, have we done this? The answer is yes. From 1988 through 1996, the Center for Marine Conservation, under contract with NOAA, conducted a public education program to educate related industries and the general public about the impacts of persistent marine debris, and their roles in its creation, removal, and proper disposal. Funding for this effort was terminated. This public education effort was successful and unfortunately a mechanism to replace it still does not exist today.

The National Sea Grant College Program is a partnership between U.S. universities and NOAA that began in 1966, when Congress passed the National Sea Grant College Program Act. Today, many of the twenty-nine Sea Grant Colleges have outreach or education programs that address marine debris problems. These programs need revitalized support to continue and expand their efforts. Again, we have a ready mechanism and conduit in place and the "fuel" for this effort is low if not dried out.

Education programs conducted by industry concerns have been effective in promoting public awareness of the marine debris issue and have encouraged compliance related solid waste handling of fishing gear. Programs in the U.S., Canada, and Nova Scotia serve as examples of what can be done, but they are few and far between. During the Education and Outreach Work Group we'll go into more detail on some of these past projects. Many of the pieces for solving the derelict gear puzzle are here in this room at this very meeting. We need to come back together, put our puzzle pieces back together, and walk out with a completed puzzle. That's our challenge, we don't need to reinvent the wheel—again. We need to take the wheel we already have and use it.

Conferences

We need to conduct these conferences. We need an exchange forum. We need a place where people come together. The effectiveness of these meetings is measured by the degree to which workgroup recommendations are implemented by national and regional agencies and organizations. Opportunities to share information and research are essential to the global reduction of marine debris and its impacts. Marine debris is one of the most pervasive pollution issues plaguing our ocean and waterways. Only through a global, integrated approach to this pollution problem can it be controlled.

Based on recommendations from previous conferences, our initial assessments were on target. Our problem is in the follow through. It is comforting to know that we were on track sixteen years ago. What has to change is that we need to actively fulfill these goals and objectives.

Incentive Programs

We need to look at creating incentive programs. Quite honestly the connection between environmental practices and economic practices is strong. You may not like to hear that, but it's the truth. The "E" in economy stands for the environment and the "E" in environment stands for economy. You have to hook them together. We need to develop a strategy that will encompass both.

One such program is being conducted in Hawai'i and includes an incentive program for local coastal fishers called the Marine Bounty Program. Floating, discarded fishing nets are known haunts for fish. All fishers know that certain areas are good places to catch fish. These areas also pose a threat for potential vessel disablement and for entanglement by a host of marine wildlife. As part of CMC's Model Communities Program, this pilot project was developed and piloted by the University of Hawai'i Sea Grant Office under the direction of Chris Woolaway. The project was piloted in Kaneohe Bay, on Oahu, where recreational and commercial fishers were awarded points for reporting the location of abandoned nets found while fishing. Points were redeemed for fishing products and other

prizes donated by local retailers. Arrangements were made to have the nets retrieved and disposed of in the local landfill. The program continues with over three tons of recovered nets and gear to date.

Chris has done a wonderful job and has many plans for future programming using the Marine Bounty Program as a model. Currently, there are plans to expand this program to other areas of Oahu and there are many more islands in Hawai'i where this effort is needed. In addition, there is discussion to tie this to a monitoring program being implemented in Hawai'i through the Coastal Zone Management Program and the Department of Land and Natural Resources. It is this type of teamwork that will make this program a success. CMC was fortunate to be able to work with Hawai'i Sea Grant. This program has gone far beyond our hopes and aspirations, and it is just the beginning.

Port and Reception Facilities

We also need to look at working with education and outreach programs for port and reception facilities. Adequate port facilities for garbage and net disposal and recycling are an essential component in managing solid wastes associated with commercial fishing and other maritime activities. The impacts on local communities that service the fishing industry can be profound. The burden for handling the solid waste from fishing activities can be substantial and requires a collaborative approach for the municipality, port authority, fishing community, and associated industries including solid waste management and plastics manufacturing.

Educational programs designed to promote compliance of MARPOL Annex V should be accompanied by practical methods of handling derelict fishing gear ashore combined with increased technologies for onboard incineration and recycling. Any plan to enforce Annex V requires a progressive and practical approach for waste handling. Inadequate, impractical plans will result in ineffective efforts.

Finding Model Programs

Now that we have refreshed our base knowledge on this issue, what do we need to do? One problem is the current deficiency of educational programs and relevant materials, which target the fishing industry, upon which to model new programs. Based on the scale and importance of this issue, relatively few programs are currently being conducted in this arena. We do have some past experiences and success from which to draw, but we need an intensive infusion of energy, funding, and programming to tackle this problem. In reviewing existing educational materials, most were found to be outdated and not relevant to current issues and technologies. We need materials to help connect us to this issue as it is today, not as it was twenty years ago.

Engaging the Proper Stakeholders

To conduct an effective educational campaign, appropriate efforts must be made to engage all the stakeholders related to this issue. The range of stakeholders in the fishing industry runs from owners and operators of large factory trawlers to members of small, subsistence, artesanal fisheries. Different approaches for education and outreach need to be devised for different size industries. You can't just focus on the fishers, they are just as much a part of the solution as they are of the problem.

Program Planning

We also need to make sure that our educational program designs are effective. We need to employ development strategies that will insure that our efforts will be effective and target appropriate audiences. This involves pilot testing, evaluation, program revision and assessment. Often time and limited resources do not allow this. We will not be starting at zero. We do have some success stories upon which to draw. Many of the early program implementers such as Fran Rick and Chuck Fowler are here for this conference. We need to review thoroughly what we have done in the past before we move forward again. If we continue to re-invent the same wheel after every conference, we will never be successful in our quest. Moving forward means you take what works and build using that as your foundation.

Use of Technology

We also need to place some emphasis on the technology sector. The technology sector's interest in developing alternatives to present technology is unclear. Working with industry on pollution prevention efforts at CMC, I know that the general public often does not know of their innovations and improvements. We need to tap into this resource as it is in their best interest to aid in our efforts to reduce the presence of derelict gear in our oceans.

Educate Leaders

And last but by no means least, we need to be sure that our government, regulators, and resource people are properly educated. They can and must be educated on the importance of this issue as well as the marine debris issue overall. We have to use the resources and influence of our agencies and organizations to make sure that they understand the importance of this problem. They are one of the key stakeholders and without them, we will not be successful and the problem will persist.

Efforts to reinstate former educational campaigns and expand existing programming to address the issue of derelict gear must be given priority during this conference. Derelict gear continues to impact the marine environment. Educating derelict fishing gear

"stakeholders" on the impacts of marine debris on the environment is necessary to change their behaviors and develop management strategies that will reduce the introduction of derelict gear into the ocean. Enforcement of international and national legislation to support MARPOL is complicated. Marine debris research and monitoring is expensive and difficult to conduct in the marine environment. Educating the public about marine debris is imperative, if this pollution source is to be controlled.

We need to refocus our attention and efforts on the establishment of cooperative efforts for fishers, fisheries and resource managers, port authorities, maritime enforcement agencies, business, and industry in forging an integrated regional effort to reduce the presence of derelict gear from our waters.

Education and outreach activities are essential components in dealing with these problems. Without these activities and programs, we will not be successful. We know what to do, we know who the stakeholders are that we need to engage in fighting this battle, and we know what the risks are if this battle is not won. We just need to do it.

CONCLUSION

Thank you for you time and attention this morning. But before I go, I need to remind you that September l6th is the 15th Annual International Coastal Cleanup. I want to encourage everyone in attendance at this conference to participate. Each pair of hands in this room should be holding one of two things—either a trash bag or a data card on that Saturday. This is an ongoing, global effort that is a product of earlier efforts to address the marine debris issue. Please get out and do the cleanup, help us continue to attack this problem—you can make a difference. There is not a single body of water on the planet now that is not involved in some way or the other with the debris problem. We can solve this problem. Let's get out and do it.

- Transcribed from a speech given on August 8, 2000.

THE U.S. COAST GUARD SEA PARTNERS CAMPAIGN EDUCATION AND PUBLIC OUTREACH EFFORT TO ADDRESS DERELICT MARINE DEBRIS

Linda J. Reid, USCGR, U.S. Coast Guard Headquarters -
Office of Response, Washington, D.C.

INTRODUCTION

Thank you very much for inviting me to speak today about the U.S. Coast Guard Sea Partners Campaign—the Coast Guard's environmental education and outreach program.

Many of us here today have participated in shoreline cleanups, either through the International Coastal Cleanup or other locally organized events. The unsightly and destructive results of the improper disposal of trash are all too familiar to everyone.

But the problem we are confronting at this conference is more than unsightly litter on an otherwise attractive beach. Derelict fishing gear can sweep across thousands of miles of ocean, an unseen threat to living marine resources.

SEA PARNTERS PROGRAM

We in the U.S. Coast Guard Sea Partners program have worked for over six years to find ways to combat a particular type of marine pollution—marine debris. Under authority of the Marine Plastic Pollution Research and Control Act of 1987, the U.S. legislation which implemented the MARPOL Annex V agreement, we have conducted a nationwide education and outreach program that has reached over two million people in the U.S.

We have formed partnerships with business groups, the boating community, educators, environmental organizations, aquariums, various segments of the public, and with state and local governments. We have enjoyed many successes and still face many challenges. I am pleased to accept your invitation to share our experiences with you, to learn more about the particular problems under scrutiny this week, and to explore ways we may work together to make the world's oceans a safer, richer realm.

The Sea Partners program operates out of Coast Guard Marine Safety Offices in all the major port cities in the country. Each Marine Safety Office has a team of Coast Guard Sea Partners who have undergone specialized training and have the time, inclination, and flexibility to present programs to our target audiences. The teams assess the needs and pollution problems in their unit's area of responsibility and decide how to focus their local program for the best results. They seek out opportunities for presentations or participation in events that provide an opportunity to speak with certain populations.

We also draw upon the talents of the Coast Guard Auxiliary, the civilian volunteer arm of the Coast Guard, particularly to reach recreational boaters, an audience with a big effect on water quality. The value of using Coast Guard Auxiliarists in reaching the recreational

boating audience is their personal knowledge of boating and the people who participate in boating. Most Auxiliarists are boat owners themselves. They know the issues that boaters deal with. They know what kinds of questions they are likely to ask.

DELIVERING THE INFORMATION

Information delivery is always a challenge. Children are an easy audience because they are held captive in their classrooms or day camps. To reach the recreational boating audience we set up information booths at boat shows and invite boat shoppers to look at displays as they walk by. Or Sea Partners may spend a "day on the docks," talking with boaters individually at marinas or boat ramps as they head out for the day. Reaching fishing industry personnel is a tougher challenge because there are fewer such opportunities where fishermen congregate.

In dealing with various types of audiences, we have to assess their current knowledge on the topic. Are they disregarding pollution laws because they are not aware of them? Are they disobeying laws in full knowledge of the consequences but figuring they won't be caught? Or are they genuinely concerned about the environment but find the laws difficult to comply with? If it's the latter, then we must consider how we can work with waterway users to remove some of the obstacles to compliance. In the case of commercial fishing, are better reception facilities needed? Or some kind of incentive for returning nets to shore?

Marina Survey Program

In tackling pollution problems created by recreational boating marinas, some Sea Partners teams have instituted an informal marina survey program which involves evaluating a marina's pollution prevention preparation and making suggestions for improvements. It is not an inspection—there are no law-enforcement consequences. The Coast Guard member or Coast Guard Auxiliarist walks the marina property with a checklist that is subsequently turned over to the owner. Some items are simple, such as tying down or covering trash receptacles so that trash cannot be blown into the water, but if the marina operator just plain hasn't thought of the consequences of the current set-up, he probably hasn't thought of the need for improvements.

In the Sea Partners Campaign we learned that recreational boaters often try to clean up a small fuel spill in the water by squirting some dish detergent on it. Many boaters our people talked to actually thought this was the proper way to clean up the spill, not realizing that: (1) they were causing additional harm to the environment by dispersing the spill into the water column; and (2) it's an illegal practice. When boaters are shown how a sorbent pad kept handy can prevent or quickly clean up a small spill at the fuel pump, they are generally glad to make the small investment to keep some on board. This is just an example of how person-to-person interaction can be effective in solving a problem. The first step

was discovering why the problem existed and then coming up with a solution workable for the user.

For coastal residents, sometimes the effective approach is to show the immediate impact of debris. Some of our Sea Partners have collected debris items from local beaches that they use in public displays and which show people what comes from local careless activity. Some examples reported are: discarded fishing line along the Verrazano Narrows bike path in New York; detached line from lobster pot buoys in Rhode Island Sound; plastic cups with turtle bite marks found on Padre Island, Texas; and a "ghost net" from the waters near Juneau, Alaska. Sea Partners use these displays to make a point about the consequences of such activity—trashy beaches, animal entanglement, injury, and death.

In the recreational boater community, the discarded monofilament line that comes back to foul a prop shows a boater how a careless action can have a direct undesired consequence. Fish that die from entanglement or ingestion of plastic are fish that cannot fill someone's dinner plate. The videos and slide shows we use in the Sea Partners program graphically show such situations.

In children's programs, we have found it's important to leave the students with some positive action they can use to help the cause. For instance, even young children can cut or tear six-pack rings apart to avoid a possible animal entanglement. They can make sure they put all their trash in the appropriate trash receptacle. They can talk with their parents about reusing and recycling household items.

Commercial fishing is, and has been for some time, big business. But business is not so good these days. Our boundless banks are getting fished out. The recent release of "The Perfect Storm" has brought the subject of commercial fishing to common conversation. At first glance, the movie is a pulse-pounder about a meteorological monstrosity, but when you get down to it, it's a bottom-line story of economic survival. Those who don't go out every chance they get, regardless of weather, lose out on their share of an increasingly competitive market. So to have any kind of success in reaching out to these businessmen, it is important to understand their business.

We can take some lessons from the Coast Guard's Commercial Fishing Vessel Safety program. This program has been expanded over the past few years because of an increase in deaths due to the sinking of fishing vessels. One main goal of the program has been to get as many fishermen as possible to participate in a voluntary dockside fishing vessel safety examination. The Coast Guard Auxiliary has helped out with a number of volunteers who have undergone training to become a fishing vessel examiner.

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Much of the success of this program has been due to the dedication of these examiners and the personal approach they bring to the task. The more knowledgeable about the fishing industry these examiners are, the more likely they are to succeed in gaining the ear of the fisherman. Fishermen are unlikely to waste their ashore time listening to someone with little understanding of their problems.

Part of the challenge is convincing fishermen to take the time for a safety inspection. Examiners have an assortment of small giveaway items—signaling mirrors, whistles, zipper lubricant, miniature tool kits—that they use to break the ice, start a conversation, and open a door. After the offer of a "freebie" and an introduction, the examiner then suggests scheduling a free safety inspection or engages the fisherman in a conversation about a specific safety issue. Pointing out a better way to store gear which will increase stability of the vessel, for instance, gets the fisherman's attention because he sees an immediate benefit to his own safety and survival. Examiners also emphasize that these exams are non-punitive—for the benefit of the vessel owner only.

With the derelict fishing gear issue, it is more difficult because the consequences of any individual's actions are not direct but aggregate. If dumping unusable gear over the side is the quick answer to an immediate problem, one obvious counter argument is that short-term economic gain will lead to long-term economic extinction. The economic impact of repairing fouled propellers or damage to other equipment caught in derelict gear is a point that must be made. And if fishermen kill fish before they can catch them by casting off gear they can no longer use, they hasten the day when they will have to tie up their boats for another vocation. In short, they need to become stewards of the resources they rely on for their living. Appealing to polluters to become stewards has been one of the tenets of the Sea Partners Campaign.

In addition to working with the fishermen, we can work to convince the public of the importance of these issues. We have had great success in Sea Partners in getting schools, scouting groups, and many others to join in public education campaigns against marine pollution. The ongoing dolphin-safe tuna debate is an example of public pressure influencing practices in a private industry. Public outrage over seeing animals entangled in plastic six-pack rings led to a design change by the manufacturer, making all currently produced rings photo-degradable.

CONCLUSION

There are many ways in which the success of the Sea Partners program may be of interest to you, and there are certainly many challenges ahead. We are a long way from having all the answers. I look forward to discussing these issues while at the conference this week and learning how we can work together toward our common goals.

A MODEL OF EUROPEAN-WIDE COOPERATION BETWEEN INDUSTRY AND THE ESTABLISHMENT

Gary Dunlin, Gear Technologist, Seafish Authority, United Kingdom

Just a few words about Seafish to help explain how we work and fit in with our fish industry.

• Set up by an act of Parliament.
• Have statutory responsibilities for the whole industry (boat to throat as it were). From the guys that build the boats through the fishers, buyers, processors, transport, storage, and the consumers.

The way we're set up gives us a guaranteed income from the levy on fish sales plus what we generate from other sources—R and D contracts. The set up, paid by industry, also makes us directly accountable to industry. My talk today—FANTARED (redes fantasmas), literally Spanish for phantom nets, a model of European-wide cooperation between industry and the establishment. In this talk I'll be:

• Describing the ghost fishing projects that fit under the Fantared umbrella.
• Outlining the sorts of concerns that they have tried to address.
• Explaining how our UK fishermen's associations reacted to the project.
• Giving you the flavour of what we've discovered so far.

First a brief rundown of the UK Static Gear Fisheries, my speciality and the focus of our efforts in the Fanta family of projects. It's made up of a gill netting sector, almost exclusively bottom set, and a thriving trapping sector. There are a wide range of boats used, but few over ~15 m (50 feet). From this cobble, a typical inshore netter/potter used in the North Sea. This 55-foot netter operates offshore in the western approaches to the English Channel, the Irish Sea, and in the channel itself often targeting prime specimens like this hake. Unfortunately, like many other netting fleets, ours has been caught up with crude imagery and suffered the 'Walls of Death' syndrome. Potting and creeling (or trapping) uses a wide variety of designs and targets a wide range of species from lobsters to Nephrops.

Now let me explain Fanta and why we felt the need to look at ghost fishing phenomena in European waters. Most previous work seemed to be opportunistic; "I know of a lost net, let's dive on it". Areas were chosen for convenient observation rather than, "How can we work out the range of what happens?" We thought that fishermen should be involved in the program because they have the most knowledge of what actually happens. We also started taking the view that we needed to know everything about fishing operations so that we could look at improving performance. We had to know the size and shape of problems and where they existed, so we could begin to sort them out. This is what we've been doing, starting in 1994:

• Fantareds are EU supported.
• Fantatrap is funded by our fisheries ministry, the Ministry of Agriculture Fisheries and Food (MAFF).

Fanta 1 was our first and quite modest project restricted to inshore shallow waters. It was in many ways a feasibility study to pave the way for a bigger more objective study and had partners from the UK, Spain, and Portugal. Fanta 2 is much more ambitious. It aims to identify, quantify, and where necessary, manage the impacts of static gear lost in European waters. As you can see it is quite a big partnership covering a very wide range of fisheries—from arctic to semi-tropical—similar in many ways to the USA. Fanta 2 involves a number of activities in its early stages like:

• NAGs—working through our federations and national organizations.
• Carrying out a review of each partner's "significant" fisheries.
• Conducting comprehensive surveys of fishermen's experiences.
• Teasing out from them and others how and where gear was being lost.
• Surveying those areas and then setting up a program to simulate the loss of gear.
• Then monitoring how the gear evolved by both physical and catch rate profiles.
• Trying to retrieve gear lost.

The aim of all this fieldwork is to:
• Understand what's going on and how it is related to targeted fishing activities.
• Look at the need and potential for change.
• Work out the implications and potential benefits, and then negotiate a way forward with our industry.

I think it's instructive to look at how our industry viewed these projects and why. I'm talking here mainly about our own experiences, but similar reactions were found by our other European partners:

• Fanta 1—Industry opposed.
• Fanta 2—Industry was cooperative.
• Fantatrap—Initiated by industry.

We needed to find out what was going on. Why the difference in attitudes? Our first experience wasn't too successful in terms of industrial relations. We didn't have a free hand in setting the project up. The luck of the draw was that we had some strong (a euphemism) personalities in local fishermen committees, often the only ones who turned up. The project was a feasibility study and was picked on for not being commercially realistic! It

involved conservationists as partners, which raised hackles. And there was an undercurrent—hard to define—of vulnerability/paranoia.

By the time we started the next project, the situation was quite different. The results from Fanta 1 were reassuring. The new project focused on commercial metiers and practices with an assurance of commercial realism as far as possible. The NAG system empowered the industry side, and they had the right to disagree with our findings via a minority report. Finally, there is a mood amongst fishers that they want to know, warts and all, what they are doing.

Our final project in the Fanta suite was actually initiated by the largest shellfish trapping association in the UK. This is a progressive association that keeps at least half an eye on market trends. They knew they could lobby for funding and they trusted us to do the work effectively on their behalf. Being commissioned by a fishers' association to do a worthwhile job is the sort of situation we want to find ourselves in more often.

Returning to the work in hand, here's a reminder of our first stages. These first four areas of inquiry allowed us to identify the main factors which cause loss and the levels of loss that are occurring and then to test our national fisheries against these factors in order to decide which should be investigated further. There are ten factors, but of these, three predominate in European waters. Conflicts between static and towed gear sectors are by far the biggest cause of loss—and this loss is defined as "permanent" loss. If it's towed away, you don't know where it is. If your ends—your buoys are lost to weather [sic]. The other main causes are water depth and fleet length, which tend to go together and reinforce one another. Certain slope fisheries have very long fleets running down the slope and are only marked at one end. What is interesting here is that these factors can be used to score any fishery for its predisposition toward gear loss.

Our experimental sites in Europe, actual and hoped for, give us a good spread of target species and ground conditions. In those areas we've tried various rapid survey options for ground where significant losses are reported, trying to reconcile fishers' accounts with conditions on the ground. These are traces here from the Celtic Sea. What are they? We've surveyed wrecks in poor conditions and good, but we've had no real success in identifying nets except in ideal conditions like headline high and clean fine/soft ground. Not often met as working harder ground is a way of avoiding trawlers. The marks earlier were cables/warps. This and the next slide are Norwegian images at slack water of nets on clean ground. You can get images, but at a cost! Having failed with remote surveying, we've used devices like this to try to recover gear from ground where high levels of loss have been reported. It's used like this—towed behind a vessel at about one nautical mile

per hour. And we've set out arrays of short fleets to track the net's evolution over time. What you see here are three replicate sets of fleets that are retrieved sequentially over a two-year period. We've also set nets on wrecks. Most of these are fairly shallow and we've used divers for early observations, deployment verification, and monitoring. What were our results from retrieval operations? Retrievals typically produce objects like this—a lot of rope, but not much netting. Under photec conditions we get a lot of this—typical on wrecks. And this was the fate of an experimental net set in the North Sea delivered ashore after four weeks! And in more detail, badly tangled up and incapable of catching anything. That's about as far as we've gotten.

Now let's step back a minute and compare what's being said in Europe with the reality of what we're finding. The sound bite images are these:

- A focus on nets (usually drift nets) and no traps.
- Lost gear fishing forever.
- Inshore grounds carpeted with nets smothering marine life.
- Lost gear constantly moving. All these things conjuring up an image of legions of undead gill nets fishing forever.
- Indiscriminate/heavy take of cetaceans, phocids, bird species, and shellfish.
- And finally the much less fashionable issue of impact on commercial species.

What we're finding in Europe is that impacts:

- Are very site specific and very depth dependent.
- Have little or no impact on non-fish species.
- Have some significant impacts on commercial species.

In as much as we can generalize about the outcomes of net loss, there seem to be three main types of outcome: inshore, set on open ground; inshore, set on or near wrecks and reefs; and those set in the deeper waters or down oceanic slopes.

In the first of these, in depths of up to ~100 fm, there are four influences that lead to a very common outcome: bio-fouling, wave action, currents, and towed gear conflict. Between them they ensure that fishing area and catch rates diminish rapidly and nets are either cleaned up or deactivated. For the special case of wrecks and reefs in inshore areas the outcome can be a little different: netting may be held open for often long periods; biofouling occurs rapidly, especially in shallow waters; and catch rates generally fall rapidly although some fishing potential may remain. The contrast to this seems to be in deeper water with a threshold of ~300 m. Out of the photic zone and with minimal water movement there seems to be the

potential for prolonged ghost fishing. This is borne out by the evidence from Norway and Canada. Retrieval exercises show nets fishing strongly after ~10 years immersion. If there are problems for us, the solutions fall into three categories: technical fixes, effort limitation, and effort management.

The first of these seems attractive at first sight, but is of limited applicability to nets. Fishermen are not confident with gear if strength is uncertain or happy with high maintenance costs. Also among the "technical fixes" category are ways of improving gear retrieval by using acoustic markers. Two obvious, but immensely unpopular, answers to the industry and always the cause of conflict are:

- Zoning—an attractive alternative, widely applied for a variety of reasons, with real potential to reduce gear loss. It has the advantage of being more readily accepted if consensus is reached on the implementation of zoning, usually at a local level.
- Allowing trawlers into a defined area after netters have been operating. This guarantees that the ground is cleaned up.

So what's next?

- There will be a continuation of fieldwork. We will be looking at mitigation measures worldwide. Conferences like this are a huge aid to these processes, drawing together expertise from all disciplines.
- Cost and benefit analyses of any mitigating measures.
- Organizing an international fishers' workshop. Building consensus and perception of fairness is very important in Europe and enables fast tracking of new approaches.
- Entering into negotiations with fishers and managers.
- Investigating what constitutes "good" practice. As in every profession there are good and bad practitioners.
- We hope to develop a Code of Good Practice. Let's take all that's good and develop it.
- Disseminate as widely as possible through reporting and publicity.
- The European inshore static gear sector has a relatively low ghost fishing impact.
- Losses in deep water are a cause for concern and need addressing.
- Effort limitation is essential for sustainability.
- Effort management holds most the potential for mitigating ghost fishing at this point.

- Transcribed from a speech given August 8, 2000.

ESTABLISHING PARTNERSHIPS TO MITIGATE THE IMPACTS OF DERELICT FISHING GEAR ON THE NORTHWESTERN HAWAIIAN ISLANDS

George "Bud" Antonelis, Chief, Protected Species Investigation,
National Marine Fisheries Service, Honolulu Laboratory, Hawai'i

The title of my talk is "Establishing Partnerships to Mitigate the Impacts of Derelict Fishing Gear on the Northwestern Hawaiian Islands." I know this seems a little anticlimactic since everyone has begun their working groups, but I think that this will help give some perspective as to where we are now and how our ongoing partnership has helped facilitate a renewed interest in the marine debris problem in the Pacific Ocean. I hope that we can use this as an example in the development of future partnerships. During the talk, I'll provide a brief background and then discuss partnerships, program goals and objectives, use of innovative techniques to address issues, significant achievements, the beneficiaries of our projects, and future plans.

By way of background—over the last eighteen years we have observed no abatement in the monk seal entanglement rates in the Northwestern Hawaiian Islands. During the mid-1990s, we started receiving intermittent reports of monk seal entanglement in marine debris attached to coral reefs. This sparked our interest and we conducted a few preliminary surveys that revealed information that was quite surprising.

We now understand that not only was this problem manifesting itself through our observations of entangled seals that were coming ashore, but also by the documentation of seals in the water that were entangled in debris attached to coral reefs. The more we surveyed coral reefs, the more debris we found.

We immediately solicited support from other agencies to help solve this huge problem. As an aside, I'd like to point out that we were dealing with a very large area that was being impacted. Our focus was on the six major breeding sites of the endangered Hawaiian monk seal: French Frigate Shoals, Laysan and Lisianski Islands, Pearl and Hermes Reef, and Midway and Kure Atolls.

This slide illustrates the number of the seals we have observed entangled in marine debris since 1982 and, as I stated earlier, there was no abatement in the entanglement rate. During 1999, we observed the highest number (n = 25) of seals entangled in marine debris ever recorded within a single field season. This slide illustrates the fact that the entanglement rate at each of these sites varies and that the differences probably reflect local variation in currents and other factors related to their location. Seals from French Frigate Shoals and Laysan and Lisianski Islands have the highest entanglement rates, while moderate rates of entanglement have been observed at Pearl and Hermes Reef and Midway and Kure Atolls.

Based on this information we began to solicit the help of other government and non-government entities. We also had photographs, such as this dramatic slide showing a NOAA diver disentangling a seal, which really instilled a lot of concern. Within a few months we were able to gather a rather impressive list of collaborators. One of the primary reasons for such a positive response is that marine debris was impacting not only the endangered monk seals, but also our precious coral reefs here in Hawai'i. Program goals have been formulated to conserve and protect the Northwestern Hawaiian Islands coral reef ecosystems with an emphasis on Hawaiian monk seals. The objectives have been designed to: optimize debris removal in high impact areas where we know monk seals frequently occur; assess the distribution, abundance, and type of debris found; and monitor accumulation rates. Mary Donohue (NMFS, Honolulu Laboratory) talked about these topics during the first day of presentations.

The techniques used for this work have been innovative and we have established an unprecedented collaboration with fourteen other agencies.

We have conducted the first quantitative assessment of derelict fishing gear on coral reefs. This work was pioneered by Ray Boland (JIMAR, Honolulu Laboratory) and later refined by Mary Donohue. Our hope is that this effort will serve as a model for similar programs in other oceans.

The main issue that this project addressed was the conspicuous and continuous threat to the Northwestern Hawaiian Islands by marine debris. It has been impacting endangered and threatened species, and it continues to destroy our wildlife. But we also know that this project was just an initial step toward a much larger need for mitigation. That's why we're all here today, to try and solve this problem.

A significant achievement of this partnership has been the removal of 77,000 pounds of derelict fishing gear. The multi-agency marine debris cleanup effort has been an ongoing program to restore the coral reefs in the Northwestern Hawaiian Islands. Although the effort has been rather small compared to the immensity of the problem, we have been making progress. We've also enhanced the survival of many protected species associated with the coral reef ecosystem, and last year we received the Silver Hammer Award from Vice President Al Gore for our conservation efforts. You can see from this slide that many people have been part of this effort. Key individuals in getting this project moving were Terry Rice from the Coast Guard, Chris Woolaway from Sea Grant, and John Henderson from the National Marine Fisheries Service.

ESTABLISHING PARTNERSHIPS TO MITIGATE
THE IMPACTS OF DERELICT FISHING GEAR ON
THE NORTHWESTERN HAWAIIAN ISLANDS

In this case, all stakeholders have benefited from our efforts to conserve one of the oldest and most diverse ecosystems in the world. Our efforts have contributed to the restoration of essential fish habitat and critical habitat for endangered and threatened species. We've also promoted stewardship ethics in the Northwestern Hawaiian Islands and we hope to continue this work with our partners in the future.

Future plans essential for the success of the program include increased international participation. We also plan to revisit several selected sites to monitor accumulation rates of debris and expand our debris reference collection in determining the sources of the debris. Also the exchange of information resulting from this conference will help us refine our techniques and methodology for future studies.

Finally, I list in this slide the key elements in putting together our partnership. The most important item was that we had a clear and present need. We also required physical assistance to begin the process of marine debris collection and disposal. Our initial success in obtaining several key partners helped attract other agencies to the alliance because it was a situation in which all stakeholders benefited, and everyone realized that this was the right thing to do.

There have been a couple of analogies mentioned at this conference and I like to think in those kinds of terms. We have been cautioned not to reinvent the wheel. I think at this stage we haven't really reinvented the wheel, we just put the wheel back on track. I'm extremely impressed with the new technology and the multidisciplinary approaches that can be used to solve the problem of marine debris, especially derelict fishing gear. With our wheel on track, we can make significant progress in mitigating the problem of marine debris in our precious coral reef ecosystem and the Pacific Ocean. Mahalo.

• Transcribed from a speech given on August 8, 2000.

GETTING THE MOST OUT OF OUR EFFORTS

Daniel J. Basta, Director, National Marine Sanctuary Program,
National Ocean Service, National Oceanic and Atmospheric Administration

INTRODUCTION

Thank you. It's always kind of strange when a person says, "Here's the person that's going to lead the charge," and you go over the hill, turn around, and you're by yourself. A lot of people in this room I'm sure have had that experience.

Allen asked me to spend some time to try to focus and motivate us by putting into perspective why we're here. I have to say that I'm extraordinarily impressed with the range of individuals that have come to this conference. It says something about the importance of marine debris. But we all have been to many, many conferences in our careers and we often go away with, "Well I met a lot of good people." I guess that's what we get from conferences, but we all seek to have more purposeful outcomes from the commitment of our time to what it is we're trying to do.

I would not want to calculate the expense that's sitting here in this room right now for everybody that's here and for how long they're going to be here. But it's a significant investment that is being made in this topic.

So the question is how can we organize ourselves so that we can make the most out of our efforts? That when we walk away from here on Friday we have taken this topic and the things we're trying to do to another level. That's what the next two days are about.

I was particularly struck by Lee's comments earlier about the 1987 meeting and other meetings that I've been to. Are there new issues? Maybe a few. Are there new strategies? Maybe a few. But don't we already know what to do? Probably! And haven't we known that for some time? The question then is: Why haven't solutions been implemented? Is another report going to add much to a pile of reports on the shelf of marine debris? Or are we maybe at a juncture here that provides an opportunity that may be a bit unprecedented for taking this topic forward? Based upon what Dr. Baker said and what I can offer in terms of changing times, I think we are at a crossroad of partnership and community building. What we haven't figured out very well is how to build these integrated fabrics to tie us together as bigger communities.

I would offer to you that this rather modest marine debris conference has an opportunity to build a bigger "marine fabric" than just on the topic of marine debris. All of you are

marine debris experts; if that's what you do every day, if it's one of the tasks you do, one of the jobs you perform. So, what happened? Why are we still behind the power curve?

So there are a couple of things that I want to stress to you. First is that in order to build bigger community partnerships, we also have to change how we work together and interact to build those partnerships. Part of that, whether we like it or not, is something called a little bit of structure and organization. The next two days, starting when I leave this podium, is putting you into working groups that are designed to do that. It's not anything terribly new, but the challenge to you is to try and step up and stick with the process. The process is trying to do two very simple things. It's trying to focus you collectively as a community on those things in a series of topic areas that are first and foremost of importance to you. Secondly it's then trying to get you to add some of the information content to actually set the conditions for understanding the costs, benefits, and impacts for implementing strategies and solutions. So there's a process that you're going to go through.

There are some rules of the road that you have to follow. Whether it's to be nice to one another or agree that every idea is a good idea because there are no bad ideas. You have to follow the rules of your panel chairs and facilitators as they try to move you to the next level; you must move with them. Ultimately they are going to ask you to take ownership by actually sitting down and writing some things that I believe would be a far more content-driven outcome from a gathering like this than is typically the case.

Now that does a couple of things for the community and for the issue. Number one, it begins to put into the process at the right time, and I think timing is everything. I'm always amazed to realize that sometimes it's not good work, not hard work, but timing. Having done all the work and being ready to jump through the window of opportunity when it opens. So we need to document what comes out of the marine debris conference that is far-reaching, that has practical elements to it, and is understandable by the process and supported by the community.

The other thing that I think works to the advantage is that this work will be put up on the web. The objective is to attempt to use this issue to establish a more virtual community around this topic in the Pacific Basin. If we are going to move forward in this 21st Century we must all understand that partnerships are the key, working together is the key, joint programs are the key, but how do we do that? I think part of what you're about today is part of the experiment on how to do that and to prove to yourselves that this actually does